

## A NEW EPIPHYTIC SPECIES OF *BLAKEA* (MELASTOMATACEAE: BLAKEEAE) FROM THE CARIBBEAN RAIN FOREST OF COSTA RICA

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**ABSTRACT.** *Blakea hammettiorum*, a new species from low elevation rain forests of southeastern Costa Rica is described, illustrated, and compared with its closest presumed relatives in the Mesoamerican region. In addition to its glabrous, coriaceous leaves with acarodomatia on the abaxial surfaces, and laterally coherent anther thecae, this new species is distinguished by its narrowly oblong, apically rounded petals, narrow free floral bracts with scattered spreading gland-tipped trichomes on the adaxial surface, hypanthia that are covered with a dense but inconspicuous matted furfuraceous indument, and calyx lobes that are conspicuously glandular-setose at the apex.

**RESUMEN.** *Blakea hammettiorum*, una nueva especie de selvas tropicales bajas de la elevación en Costa Rica del sudeste, se describe, se ilustra, y se compara con sus parientes presumidos más cercanos de la región Mesoamericana. Además de sus láminas de hoja glabra, coriáceas con acarodomas discretas en superficies abaxiales y lateralmente anteras coherentes, esta nueva especie se distingue por sus pétalos estrechamente oblongos, apicalmente redondeados y estrechos brácteas florales libres con tricomas glandulares dispersos en la superficie adaxial, hypanthia que están cubiertos con un indumento denso, pero poco visible, y lóbulos del cáliz que brillan por su glandular-setosos en el ápice.

**Key words:** Melastomataceae, *Blakea*, Costa Rica, Mesoamerica, Cerro Amu, epiphyte

### INTRODUCTION

When *Blakea* is expanded to include the genus *Topobea* which is supported by morphological and DNA sequence data (Penneys 2007), it becomes a monophyletic genus of more than 180 species with a center of diversity in the northernwestern Andes of South America and adjacent parts of Panama and Costa Rica. The genus is characterized by its axillary flowers that are subtended by two pairs of decussate bracts, berry fruits, ovoid to pyramidal seeds with a more or less smooth testa, and wood with multiseriate rays and the frequent occurrence of druses (Almeda 1990).

The one known gathering of the new species of *Blakea* described here was sent to me long after the manuscripts for the Melastomataceae of Costa Rica (Almeda et al. 2007) and Mesoamerica (Almeda 2009) had gone to press. It is presently known only from the rain forests of Cerro Amu (Cordillera de Talamanca) on the Caribbean slope of Costa Rica. Until the lower slopes of adjoining areas in Costa Rica and Panama are better explored botanically one cannot confidently predict whether it is a species of restricted distribution like so many epiphytic members of the genus.

With the addition of this novelty, 35 species of *Blakea* are now known from the Mesoamerican region (Almeda 2009). Nineteen of these species occur in Costa Rica, nine of which are endemic to the country (Almeda et al. 2007).

### TAXONOMIC TREATMENT

***Blakea hammettiorum*** Almeda, sp. nov. TYPE: Costa Rica. Limón Province: Cantón de Matina, Z.P. Barbilla, Cordillera de Talamanca, Cerro Amu, entre Río Barbilla y Río Dantas. 09°59'20"N, 83°25'50"W, 300 m, 1 November 1988 (fl. & fr.), G. Herrera & A. Martínez 2264 (holotype, CAS; isotypes, BM, COL, CR, EAP, FLAS, INB, K, MEXU, MG, MO, PMA, US). FIGURE 1.

Climbing epiphytic shrub with adventitious roots tightly adhering to host tree. Upper branchlets terete to rounded-quadrate, glabrous and sparsely lenticellate with raised elevated interpetiolar lines or ill-defined ridges at the somewhat swollen nodes. Young buds and unexpanded leaves typically covered with an amorphous brown furfuraceous indument that often obscures the actual surface. Mature leaves of a pair equal or nearly so, glabrous on both surfaces; petioles 6.5–14.2 mm long; blades coriaceous when dry, 3.6–8 cm long and 1.2–3.6 cm wide, ovate to elliptic-ovate, apex gradually attenuate, base rounded to obtuse, margin entire, mostly 5-nerved with an inconspicuous knob-like protuberance (acarodomatium) at the abaxial base in the angles between the primary vein and each of the two proximal secondary veins, the vaguely prominulous transverse tertiary veins spaced 0.65–0.98 mm apart at the widest portion of the blade. Flowers fragrant, ± erect, solitary or paired in the uppermost leaf axils;

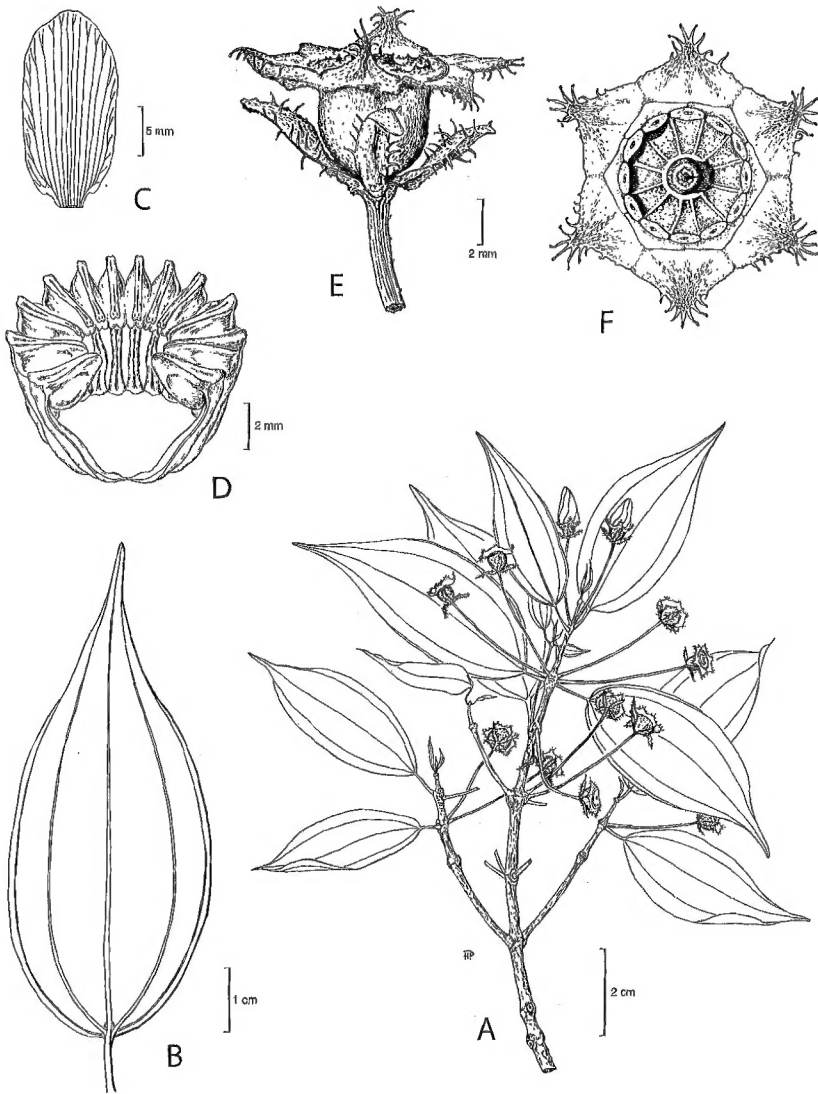


FIGURE 1. *Blakea hammettiorum*. A. Habit. B. Representative leaf blade (abaxial surface). C. Petal. D. Androecium showing laterally coherent anthers forming a semicircular ring. E. Young fruiting hypanthium showing free inner and outer floral bracts and spreading calyx lobes. F. Top view of ovary apex showing stylar scar, filament scars on the torus and spreading calyx lobes. (From Herrera & Martínez 2264, CAS, INB & MO).

peduncles 2–3.5 cm long, terete, copiously striolate and sparingly lepidote-furfuraceous to glabrous when dry. Floral bracts sessile, entire, free to the base, only the median vein elevated and conspicuous on the abaxial surface, fringed with a few gland-tipped trichomes (0.3–0.6 mm long), furfuraceous-lepidote to glabrate on both surfaces, sometimes with a scattering of glandular trichomes (0.35–0.67 mm long) on the adaxial surface; outer bracts 5.1–6.3 mm long, 1.5–1.7 mm wide, linear-oblong, apex bluntly acute to obtuse or rounded; inner bracts 4.3–5.6 mm long, 5.6 mm long, 1.1–2.4 mm wide, oblong, apex

obtuse to rounded. Hypanthia (at anthesis) sub-urceolate to campanulate, 3–4.7 mm long to the torus and 3.7–4.5 mm in diameter at the widest point, densely covered with an amorphous furfuraceous indument. Inner torus summit bearing a minute continuous but deciduous ring of rusty brown fimbriate trichomes between the petal and filament scars. Calyx tube 0.1–1.3 mm long; calyx lobes spreading, 1.5–1.7 mm long, 2.8–3.3 mm wide basally between lobe sinuses, deltoid to rounded-deltoid, fringed with spreading glandular trichomes (0.5–0.9 mm long), adaxial

surface glabrous, abaxial surface with an indument like that of the hypanthium and with a blunt  $\pm$ oblong callose thickening at the abaxial apex of each lobe. Petals 6 in number, 16.7–20 mm long, 7.2–10.1 mm wide, oblong to oblong-obovate, pinkish-lilac, apically obtuse to rounded, entire. Stamens 12, isomorphic; filaments 3.6–4.7 mm long, complanate, glabrous and declined to one side of the flower opposing the style; anthers 3.2–3.5 mm long, 1.5 mm wide, oblong in profile view, yellow, laterally compressed and connate for their entire length, each anther bearing two approximate pores at the bilobulate apex; connective somewhat thickened dorsally but not prolonged into an appendage. Ovary 6-locular, glabrous at the smooth or fluted summit with a blunt elevated stylar scar. Style 10.3–19 mm long, somewhat declinate and hooked or strongly curved distally, glabrous; stigma capitate. Immature berry 3.5–3.9 mm long, 4.1–4.3 mm wide. Seeds not seen.

**Distribution and habitat.** The type and only known material of this species was collected in rain forest vegetation on Cerro Amu, in the easternmost lower slopes of the Cordillera de Talamanca on the Caribbean versant of Costa Rica at 300 m. Since this area is part of the Zona Protectora Barbilla, the conservation of this species does not appear to be a matter of concern at this time.

**Discussion.** *Blakea hammettiorum* is distinguished by its completely free narrowly oblong inner and outer floral bracts that are furfuraceous-lepidote to glabrate on both surfaces and fringed with gland-tipped trichomes, well-defined, deltoid to rounded-deltoid calyx lobes that are also fringed with spreading glandular trichomes, oblong to oblong-obovate petals, laterally compressed anthers that are connate for their entire length, and terete hypanthia densely covered with an amorphous furfuraceous indument. Among the Mesoamerican epiphytic species of *Blakea* with free foliaceous floral bracts and laterally connate anthers that form a semicircular ring around the style, *B. hammettiorum* is most like *B. gracilis* Hemsl., *B. foliacea* Gleason, and *B. litoralis* L.O. Williams. Both *B. gracilis* and *B. litoralis* differ in having a truncate to obscurely lobulate, glabrous calyx, and glabrous inner and outer floral bracts. Both of these species also differ from *B. hammettiorum* in having glabrous hypanthia and wider (1–2 cm) floral bracts that envelop and conceal floral buds prior to anthesis. *Blakea hammettiorum* appears to be most like *B. foliacea*, a southern Mesoamerican endemic that is rare in Costa Rica but widespread and common in Panama (Almeda 2000). *Blakea hammettiorum* and *B. foliacea* both have the inconspicuous acarodomatia on abaxial foliar surfaces and well-defined deltoid to rounded-deltoid calyx

lobes. The latter lacks glandular trichomes on the calyx lobes and floral bracts but it has a sparse to moderate stellulate-furfuraceous indument on both surfaces of the floral bracts and calyx lobes. *Blakea foliacea* also differs in having larger leaf blades [(4.5)7–16  $\times$  2.5–9 cm] that are caudate-acuminate at the apex, larger (2.2–7.5  $\times$  1.4–2.9 cm) obovate petals that are consistently flushed with a band of pink-red along the abaxial margin, and longer staminal filaments (5.5–9 mm).

The acarodomatia of this new species, which are small, knoblike, and inconspicuous, will require additional analysis when more and better material of this species is collected. These domatia are unlike the eight different kinds of domatia enumerated for the Blakeae by Penneys and Judd (2011). I suspect that the apex of these small knoblike structures may eventually rupture to create a recessed pit (lebetiform domatium). The latter is commonly found in *B. foliacea*, *B. gracilis*, and *B. litoralis*, all presumed close relatives of *B. hammettiorum* that form a paraphyletic clade based on morphological characters (Penneys and Judd 2011).

Although laterally connate anthers (synandry) are found in several species of *Blakea*, they are uncommon in the Melastomataceae generally. Laterally connate anthers are otherwise known to me among neotropical melastomes only in *Miconia symphyandra* Triana and a group of related neotropical species in the Miconieae clade from Colombia and Panama. The occurrence and significance of synandry has been largely ignored in the literature of pollination biology but its significance has recently been addressed by Willmer (2011). Like the majority of Melastomataceae, pollen removal from the flowers of *Blakea* is usually accomplished by thoracic vibration (sonication or buzz pollination). This specialized mode of pollination, which is almost always associated with poricidal anthers, is mostly used by certain genera of bees (Buchmann 1983; Renner 1989). It is possible that lateral connation of fairly large anthers helps to strengthen the androecial unit as a grasping and maneuvering device during pollination by buzzing bees (Willmer 2011).

**Etymology.** It is with great pleasure that I name this species in honor of Dr. Benjamin and Ruth Hammett, long-time friends and veteran travel companions to diverse destinations, in recognition of their unflagging interest and staunch support of biodiversity research and conservation in the neotropics and elsewhere.

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